IWAC Display v2

Access Controller with Display

ZVIIWACDV2

Application Program Version: 1.1
User manual edition: [1.1]_a

www.zennio.com

USER MANUAL

CONTENTS

1 INTRODUCTION

1.1 IWAC DISPLAY V2

IWAC Display v2 from Zennio is a KNX interface presented as an access control system to rooms or other parts of the installation through reading ID cards.

The most notable features of this device are:

- **Access control** to rooms using cards with **NFC (*Near Field Communication*) technology** of **MIFARE DESFire** and **MIFARE Classic** types.
- 2.4-inch **OLED** display with 128 x 64 pixels resolution.
- **Multilanguage.**
- **Buzzer** for an audible acknowledgement of user actions (with the possibility of disabling it by object).
- **Encrypted communication** with **Securel** for door opening.
- **Communication with Z-Access** for the management and monitoring of accesses.
- **3 touch buttons,** which can operate as individual control.
- Possibility of **locking / unlocking the touch panel** through binary object.
- Possibility of setting a **press detection delay**.
- **Two analogue/digital inputs** (for motion detectors, temperature probes, additional switches, etc.).
- **Heartbeat**.

1.2 ACCESS CONTROL SYSTEM

The following figure shows the main elements involved in an access control system and the interactions between them:

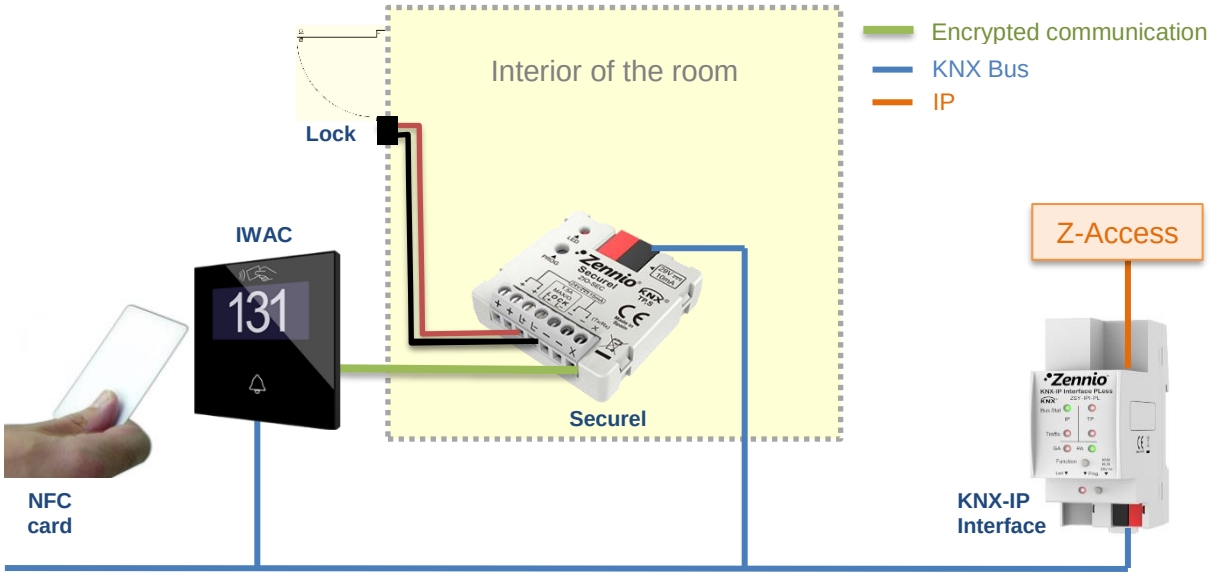

Figure 1. Access control system elements.

- **IWAC** (*In-Wall Access Control*): NFC reader for access control that is installed outside the room.
- **Securel**: final element acting on the lock when granting access from IWAC. It is installed inside the room.

  In the idle state, Securel will keep the electric strike locked to prevent the door opening. When the *Open* command is correctly received from IWAC (access granted), Securel will release the lock for a while to open the door.
- **BMS** (*Building Management System*): computer system that assumes the integral automation of the building.
- **Z-Access**: application that allows employees to record access cards. In addition, by means of a specific module of the BMS system, permits the joint coordination of the different IWAC and the notification of certain events.
- **NFC card**: passive element for accessing to certain rooms. IWAC Display v2 is compatible with two types of cards: **MIFARE DESFire** and **MIFARE Classic**.

As indicated before, for security reasons, the communication between IWAC and Securel is encrypted.

Both IWAC and Securel are connected to the KNX bus.

The data used by the system to allow or deny the access are:

- Groups: sets of users or cards with the same access level. The groups available are:
  - Guest
  - Visitor
  - Staff
  - Management
  - Service
  - Cleaning
  - Maintenance
  - Security
- Card Identifier: unique NFC card identifier.
- IWAC Display v2 Identifier: unique IWAC Display v2 identifier.

When recording data access to a card, the Z-Access application offers two alternatives to the employee:

- **Associate the card with a specific group**: the identifier of the selected group will be recorded in the card. This option only supports DESFire cards.
- **Associate the card with a specific IWAC Display v2**: the identifier of the IWAC Display v2 will be recorded in the card (see section 2.5). Any card associated with a specific IWAC Display v2 will be also associated with the group “Guest”.

Any IWAC Display v2 has a unique identifier set by parameter. And it will gran or deny the accesses according to its lists:

- **White list**: groups with access granted. This list is set by parameter (see section 2.5). In addition, IWAC Display v2 allows access to all the cards associated with its identifier.
- **Black list**: groups or cards with access denied. This list is set in Z-Access and transmitted to IWAC Display v2 through the KNX bus.

The black list takes precedent over the white list (see examples below).

Note: *an IWAC Display v2 that has the "Guest" group in its white list will allow access to any card associated with any specific IWAC Display v2, so it is a configuration intended for access control of common areas.*

Examples:

Card 1	**Card 2**	**Card 3**	**Card 4**
IWAC 124 Group "Guest"	IWAC 245 Group "Guest"	Group "Cleaning"	Group "Staff"

IWAC 124 White list: Black list:	Card 1 → Access granted Card 2 → Access denied Card 3 → Access denied Card 4 → Access denied
IWAC 245 White list: Cleaning Black list:	Card 1 → Access denied Card 2 → Access granted Card 3 → Access granted Card 4 → Access denied
IWAC Swiming pool White list: Guest, Cleaning Black list:	Card 1 → Access granted Card 2 → Access granted Card 3 → Access granted Card 4 → Access denied
IWAC Gym White list: Guest, Staff Black list: Card 2	Card 1 → Access granted Card 2 → Access denied Card 3 → Access denied Card 4 → Access granted
IWAC Spa White list: Guest, Cleaning Black list: Guest	The spa is temporarily restricted to guests by putting the group on the black list: Card 1 → Access denied Card 2 → Access denied Card 3 → Access granted Card 4 → Access denied

1.3 INSTALLATION

IWAC Display v2 connects to the KNX bus through the on-board KNX connector. This device requires an external 24V DC power supply.

1. KNX connector.
2. Programming LED.
3. Programming button.
4. Inputs.
5. Touch areas.
6. OLED display.
7. NFC antenna.
8. Auxiliary Power Supply.
9. Encrypted communication port

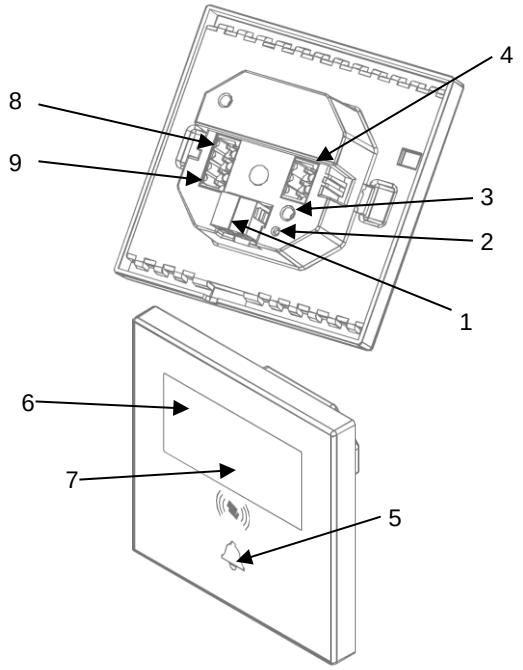

Figure 2. IWAC Display v2

The main elements of the device are described next.

- **Programming button (3):** a short press on this button sets the device into the programming mode, making the associated LED (2) light in red.

  Note: *if this button is held while plugging the device into the KNX bus, the device will enter into* ***safe mode****. In such case, the LED will blink in red every 0.5 seconds.*

- **Inputs (4):** input ports for the insertion of the stripped cables of external elements such as switches / motion detectors / temperature probes, etc. One of the two cables of each element need to be connected to one of the slots labelled “1” to “2”, while the other cable should be connected to the slot labelled as “C”. Note that all the external input devices share the “C” slot for one of the two cables. Please secure the connection by means of the onboard screws.

- **Auxiliary power supply (8)**: external power of IWAC Display v2 is supplied from Securel (see Figure 3).

- **Encrypted communication port (9)**: input port to connect with Securel to make it possible the communication between both devices.

Figure 3 shows a connection diagram of IWAC, Securel, power supply and electric strike:

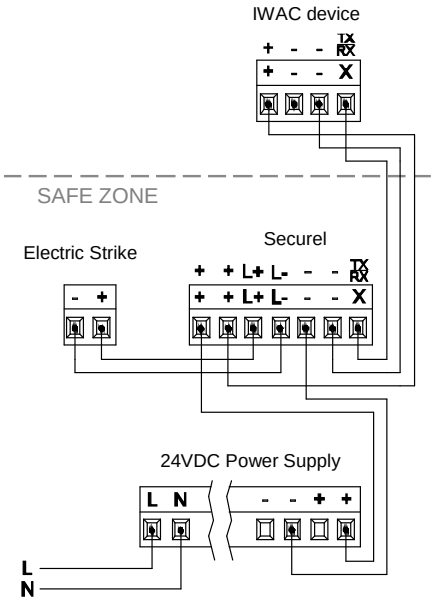

Figure 3. Access Control System connection diagram.

For detailed information about the technical features of the device and for safety instructions or about the installation process, please refer to the corresponding **Datasheet**, bundled with the original package of the device and also available at www.zennio.com.

1.4 START-UP AND POWER LOSS

After the device start-up, it requests date and time through the object **"Request Date and Time"**. The group address of this object is the one that must be indicated in Z-Access to respond to the request.

For proper operation of the buttons, it is recommended not to be pressing them during the initialization, either after programming or after connecting the external power supply.

On the other hand, a KNX bus power failure **does not imply any change in the device status since it has external power supply**. Therefore, the device will continue operating normally, although, of course, there will be no communication with the KNX bus.

2 CONFIGURATION

2.1 GENERAL

After importing the corresponding database in ETS and adding the device into the topology of the desired project, the configuration process begins by entering *Parameters* tab of the device.

ETS PARAMETERIZATION

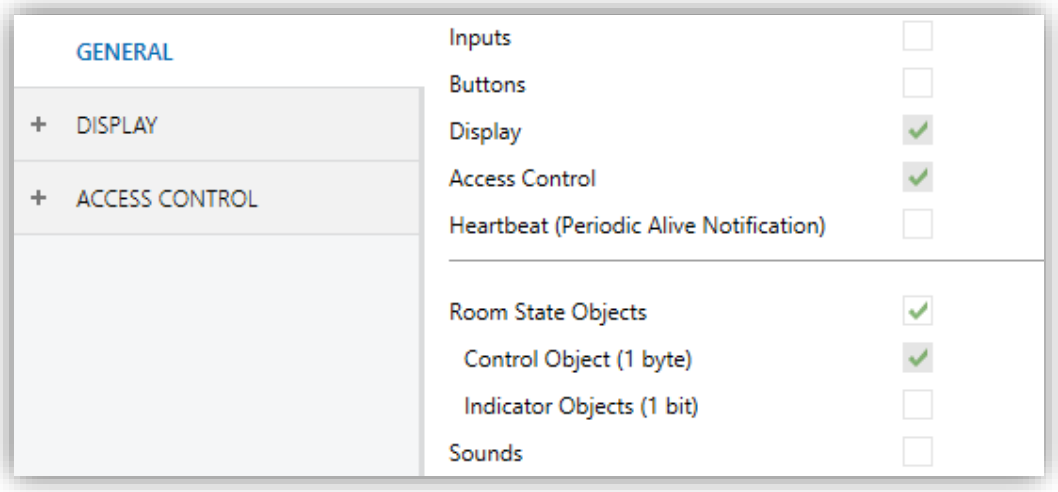

Figure 4. General Configuration.

- **Inputs**: enables or disables the “Inputs” tab in the tree on the left, depending on whether the device will or will not be connected any external accessories. See section 2.2 for details.

- **Buttons**: enables or disables the “Buttons” tab in the tree on the left, depending on whether the device will or will not be connected any external accessories. See section 2.3 for details.

- **Display**: read-only parameter to make it evident that the “Display” tab is always enabled in the tab tree on the left. See section 2.4 for details.

- **Access Control**: read-only parameter to make it evident that the “Access Control” tab is always enabled in the tab tree on the left. See section 2.5 for details.

- **Heartbeat (Periodical Alive Notification)**: incorporates a one-bit object to the project ("**[Heartbeat] Object to Send '1'**") that will be sent periodically with a value of "1" to notify that the device is still working (still *alive*).

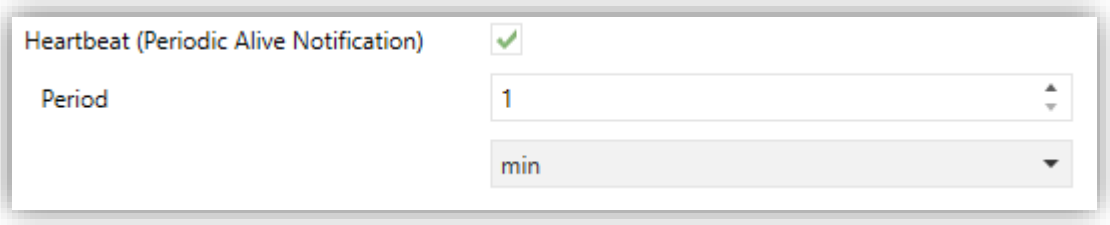

Figure 5. Heartbeat (Periodical Alive Notification).

Note: *The first sending after download or bus failure takes place with a delay of up to 255 seconds, to prevent bus overload. The following sendings match the period set*.

- **Room State Objects:** incorporates some communication objects to control the room status. These objects are:

  - **"Room State: Control"** (1 byte): allows changing the room status. The values available are: 0 = Normal, 1 = Make Up, 2 = Do Not Disturb.

  - **"Room State: Make Up Room (Status)"** (1 bit): indicates whether the room is in "Make Up" status ('1') or not ('0').

  - **"Room State: Do Not Disturb (Status)"** (1 bit): indicates whether the room is in "Do Not Disturb" status ('1') or not ('0').

  Refer to section 2.4 to see icons associated to each status.

- **Sounds:** incorporates the object "**Sound**" to enable/disable sound at runtime. It is possible to parameterise the **object polarity** ("0 = Disable; 1 = Enable" o "0 = Enable; 1 = Disable").

The project topology shows the following objects by default:

- **"Request Date and Time**": object to request time and date update.

  Important: *time setting must be done through the bus, by means of an external reference.*

- **"Access Log"**: 14-byte object which is sent to the bus every time there is access attempt. The information that is transmitted is different according to the following cases:

  - The card does not belong to the system: the card read has not been recorded with our Access control system. The following fixed message is transmitted: "*Invalid Card*".

  - The card belongs to the system: the card is valid. The following information is transmitted: UUID of the card in ASCII format and, also, the most significant bit of the first character of the object is used to indicate whether the access has been granted or denied, where 0 = Access Denied and 1 = Access Granted.

Example

The following are possible log messages for an attempt to access a room with a card with UUID '04 FB 10 8A 00 00 C7 ':

- ***Invalid card**: "Invalid Card"*
- ***Access Granted**: "°4FB108A0000C7". The degree symbol corresponds to the transformation of the most significant bit: 0 (ASCII) → 0x30 (Hex) → 00110000 (binary) → 10110000 (MSB = 1) → ° (ASCII).*
- ***Access Denied**: "04FB108A0000C7".*

2.2 INPUTS

IWAC Display v2 incorporates **2 analogue/digital inputs**, each configurable as a:

- **Binary Input**, for the connection of a pushbutton or a switch/sensor.
- **Temperature Probe**, to connect a temperature sensor from Zennio.
- **Motion Detector**, for the connection of a motion detector (models ZN1IO-DETEC-P and ZN1IO-DETEC-X from Zennio).

  Important: *Older models of the Zennio motion detector (e.g. ZN1IO-DETEC and ZN1IO-DETEC-N) will not work properly with IWAC Display v2.*

2.2.1 BINARY INPUT

Please refer to the **"Binary Inputs"** user manual, available under the IWAC Display v2 product section at www.zennio.com.

2.2.2 TEMPERATURE PROBE

Please refer to the **"Temperature Probe"** user manual, available under the IWAC Display v2 product section at www.zennio.com.

2.2.3 MOTION DETECTOR

It is possible to connect motion detectors (models **ZN1IO-DETEC-P** and **ZN1IO-DETEC-X** from Zennio) to the input ports of IWAC Display v2. This brings the device with the possibility of monitoring motion and presence in the room, as well as the light level. Depending on the detection, different response actions can be parameterised.

Please refer to the **"Motion Detector"** user manual, available under the IWAC Display v2 product section at www.zennio.com, for detailed information about the functionality and the configuration of the related parameters.

Notes:

- The ZN1IO-DETEC-P motion detector is compatible with a variety of Zennio devices. However, depending on the device it is actually being connected to,

the functionality may differ slightly. Therefore, please refer specifically to the aforementioned user manual.

- Motion detectors with references ZN1IO-DETEC and ZN1IO-DETEC-N are not compatible with IWAC Display v2 (may report inaccurate measurements if connected to this device).

- When connected to IWAC Display v2, the rear micro-switch of model ZN1IO-DETEC-P should be set to position “Type B”.

2.3 BUTTONS

2.3.1 CONFIGURATION

As indicated in previous sections, IWAC Display v2 features **three buttons** at the user´s disposal for the execution of different actions.

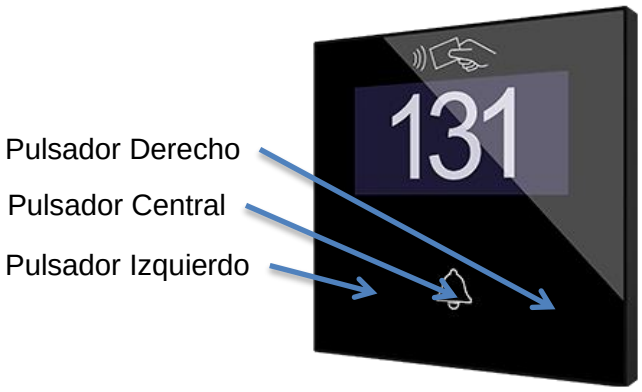

Figure 6. Buttons.

The touch panel of IWAC Display v2 can be optionally locked and unlocked anytime by writing a configurable one-bit value to a specific object provided for this purpose.

All the buttons are identical; this brings a high level of versatility for a wide variety of applications. The following is a list of the functions that can be assigned to each button.

- Binary.
- Hold & release.
- Two objects (short press / long press).
- Scene.

ETS PARAMETERIZATION

When the Buttons function has been activated in the General parameter screen, the Buttons section will be available in the tree on the left, containing itself a tab named Configuration.

The screen is divided into two zones: enable buttons and lock buttons.

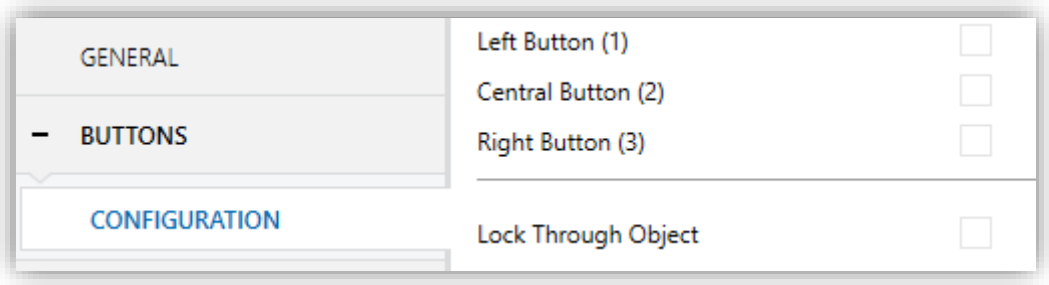

Figure 7. Buttons - Configuration.

After enable each button, will be available a new tab in the tree on the left.

When enabling **Lock Through Object** the communication object "**[Buttons] Lock**" is added and a parameter for selecting the object polarity appears: "0 = Lock; 1 = Unlock" "0 = Unlock; 1 = Lock".

2.3.2 LEFT/CENTRAL/RIGHT BUTTON

The following is a list of the functions that can be assigned to each button.

- **Disabled**: while a button stays disabled, it will not be functional. Touching on it will not cause the execution of actions.
- **Binary**: whenever the user touches the button, a binary value will be sent to the KNX bus. This value is configurable and may be 0 or 1, or alternate with every touch according to the sequence 1 → 0 → 1 → ….
- **Hold & Release**: as soon as the user touches the button, a binary value ("0" or "1", configurable) will be sent to the KNX bus. And as long as the user releases the button, another value ("0" or "1", also configurable) will be sent through the same object.
- **Two Objects (short press / long press)**: an integer values or a specific binary values will be sent both after a short or a long press (a different object will be used in each case).
- **Scene**: after the user touches the button, an order to run a specific scene (configurable) will be sent to the bus.

In all cases, it can be configured a **Press Detection Delay**. During this time, no press will be considered.

ETS PARAMETERIZATION

When an individual button has been enabled, a specific tab becomes available under "Buttons" in the tree on the left.

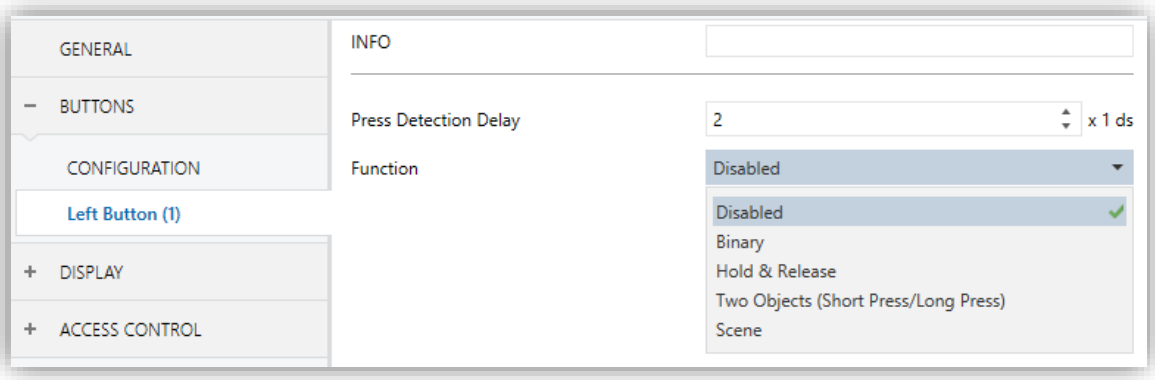

Figure 8. Button - Individual Button.

Note: *the INFO textboxes are functionless. They simply bring the option to add a description to each button of the project.*

The main parameter that needs to be configured is:

- **Function**: sets the desired function for the button: "Binary", "Hold & Release", "Two Objects (Short Press/Long Press)" or "Scene".

Depending on the function, some more parameters are involved (as described next). Please note that in the next pages "**[n]**" is used as a general notation for the communication objects, where "n" depends on the particular button (1 → Left button, 2 → Central button and 3 → Right button).

Binary

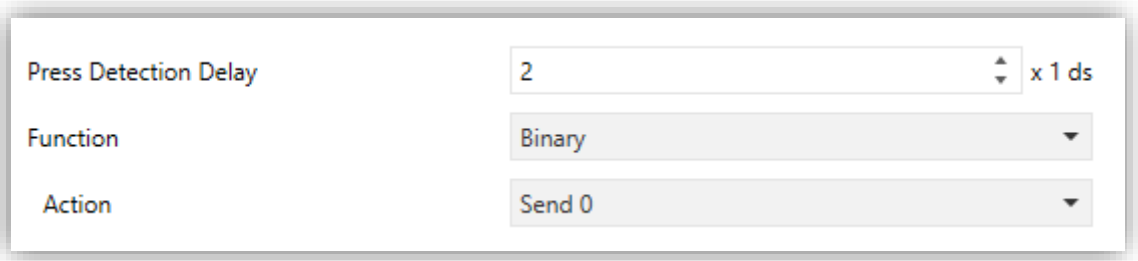

Figure 9. Button – Binary.

- **Action**: sets the value to be sent to the bus (through object "**[Button] [n] Binary Control**") when the user touches the button. The options are "Send 0", "Send 1" and "Toggle 0/1".

Hold & Release

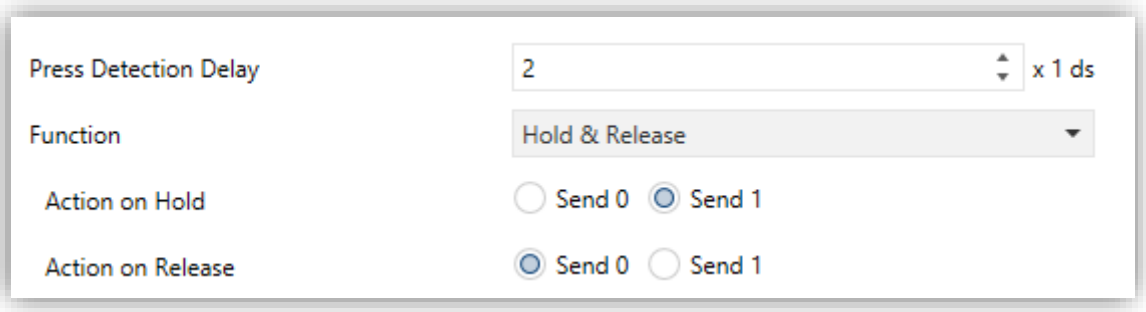

Figure 10. Button - Hold & Release.

- **Action on Hold**: sets the value to be sent to the bus (through **"[Button] [n] Binary Control, Hold & Release"**) when the user touches the button. The options are "Send 0" and "Send 1" (default).

- **Action on Release**: sets the value to be sent to the bus (again, through **"[Button] [n] Binary Control, Hold & Release"**) when the user stops touching the button. The options are "Send 0" (default) and "Send 1".

Two Objects (Short Press/Long Press)

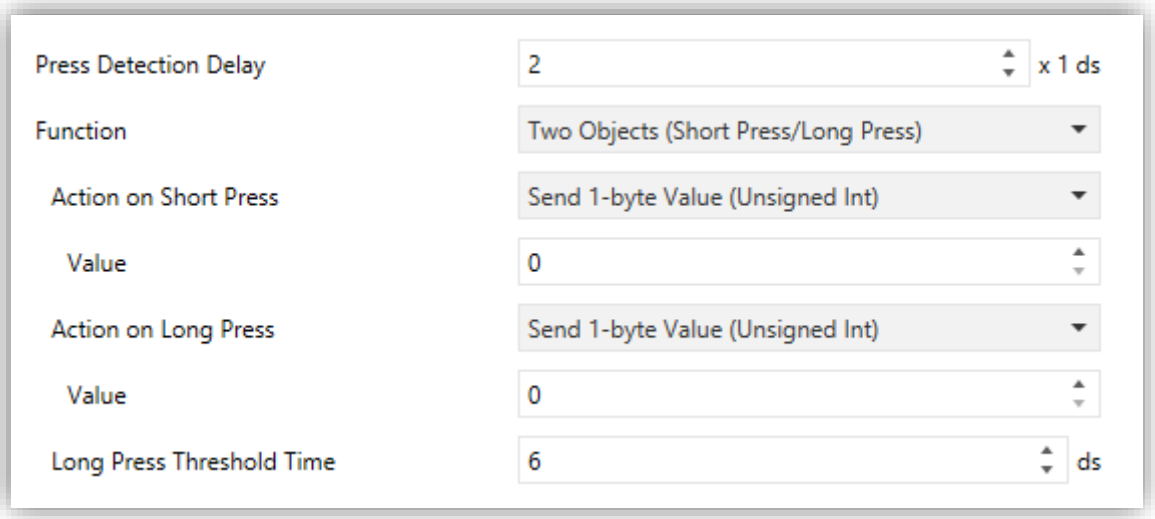

Figure 11. Button - Two Objects (Short Press/Long Press).

- **Action on Short Press**: sets the value to be sent to the bus (through **"[Button] [n] Two Objects, Short press"**) when the user short-presses the button. The options are "Send 0", "Send 1", "Toggle 0/1" and "Send 1-byte value". In case of selecting the latter, an additional parameter (**Value**) will be displayed to enter the desired one-byte value (0-255).

- **Action on Long Press**: sets the value to be sent to the bus (through **"[Button] [n] Two Objects, Long press"**) when the user long-presses the button. The options are the same as for the short press.

- **Long Press Threshold Time**: sets the minimum time the user should hold the button in order to consider it a long press. The available range is 4 to 255 tenths of a second, being 6 tenths the default value.

  Note: *To detect a long press, the pressing time must be the sum of the **Press Detection Delay** plus the **Long Press Threshold Time**.*

Scene

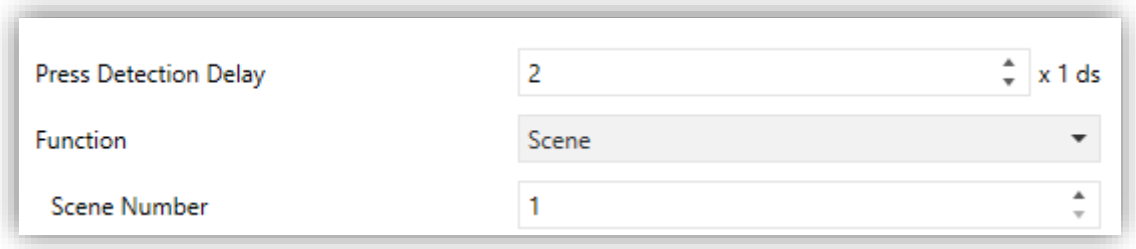

Figure 12. Button – Scene.

- **Scene Number**: number of the scene (1 – 64) to be sent to the bus.

2.4 DISPLAY

As indicated in previous sections, IWAC Display v2 features a 2.4-inch OLED display with 128 x 64 pixels resolution.

The screen shows to the user fixed information as well as notifications. The information that can be shown on the display is:

- Name or number of the room.
- Room state.
- Notification of events.

The characters supported in IWAC Display v2 are: Unicode U+0021 - U+00FF (refer to https://www.utf8-chartable.de/unicode-utf8-table.pl to see the character table for these codes).

ETS PARAMETERIZATION

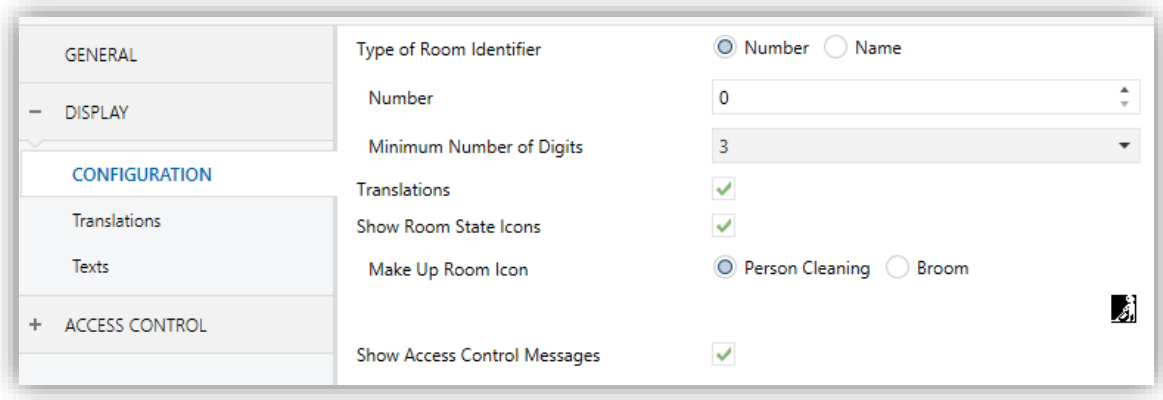

Figure 13. Display - Configuration.

This parameter screen contains the following options:

- **Type of Room Identifier**: defines if the room will be identified by a "Number" or a "Name". In case of selecting number, an additional parameter **Minimum Number of Digits** will be displayed to set the minimum number of digits that will be shown (for example, if number is 19 and minimum number of digits 3, the display will show 019).

Figure 14. Room Identifier. Lerft: number, right: name.

- **Translations**: enables or disables the “Translations” tab in the tree on the left. See section 2.4.1 for details.

- **Show Room State Icons**: enables or disables the room status indicator icons to display on the screen. As indicated before, the room status are: normal (no icon), cleaning and do not disturb.

  It is possible to choose between two different icons for cleaning status: "Person Cleaning" or "Broom". When in do not disturb status, a lock is displayed.

Figure 15. Room State.

- **Show Access Control Messages**: enables or disables the “Texts” tab in the tree on the left. See section 2.4.2 for details.

2.4.1 TRANSLATIONS

The information shown on the display can be translated into up to five different languages, among which the IWAC Display v2 will show the one corresponding to the language settings recorded on the access card.

ETS PARAMETERIZATION

After enabling **Translations** in the "Configuration" screen of the display, a new tab will be incorporated into the tree on the left.

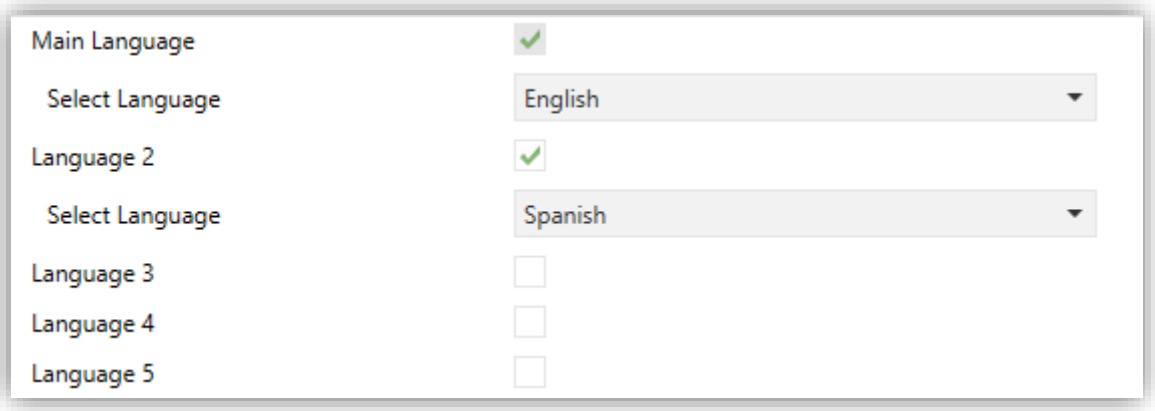

Figure 16. Display – Translations.

This screen contains the following parameters:

- **Main Language**: read-only parameter to make it evident that the main language is always enabled.
  - **Select Language**: list of the available languages.
- **Language X**: enables or disables the additional language X.
  - **Select Language**: list of the available languages to select the language X.

2.4.2 TEXTS

In the "Texts" tab, the texts of the messages prompted up when some events occur are configured:

- Access granted: reading a card with access permission.
- Access denied: reading a card with no access permission.
- Access granted when in "do not disturb": reading a card with access permission when IWAC Display v2 is in do not disturb mode.

ETS PARAMETERIZATION

After enabling **"Show Access Control Messages"** in the "Configuration" screen, a new tab will be incorporated into the tree on the left.

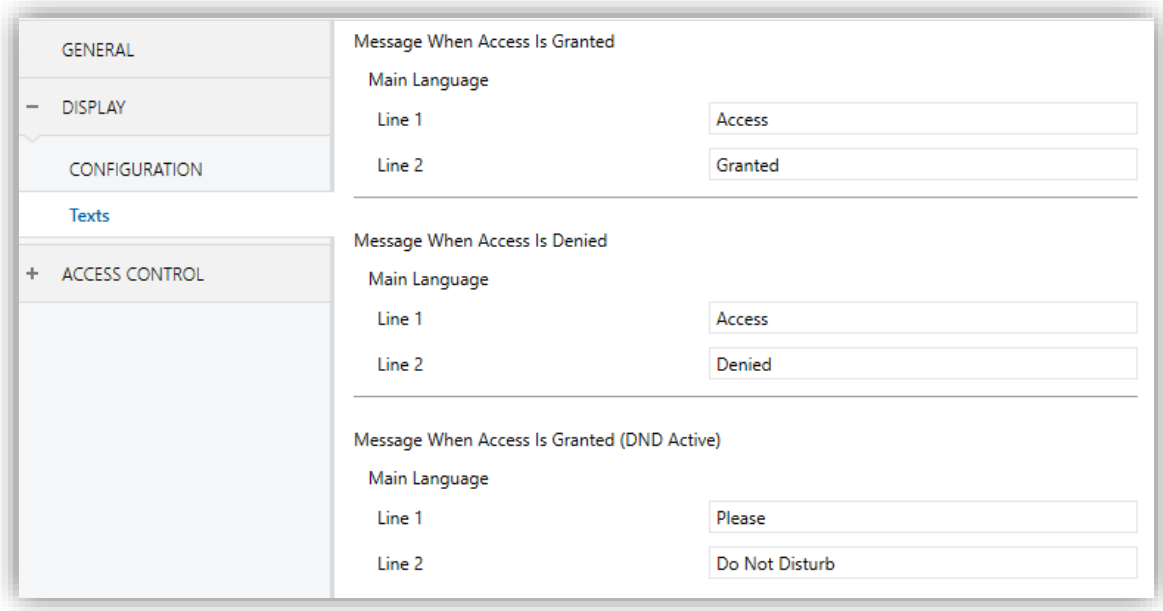

Figure 17. Display – Texts.

The screen is divided into three zones:

- **Message When Access Is Granted.**
- **Message When Access Is Denied.**
- **Message When Access Is Granted (DND Active).**

Parameters **Line 1** and **Line 2** permit setting the texts for each message. If several languages have been enabled in the "Translations" tab (see section 2.4.1), it can be set the text for each language.

Figure 18. Messages displayed according to the parameterisation of Figure 17.

2.5 ACCESS CONTROL

The main functionality of IWAC Display v2 is access control. In order to properly manage accesses is necessary the correct configuration and installation of all elements of the system (see section 1.2 and section 1.3).

In this section certain options related to access control of the IWAC Display v2 can be configured.

ETS PARAMETERIZATION

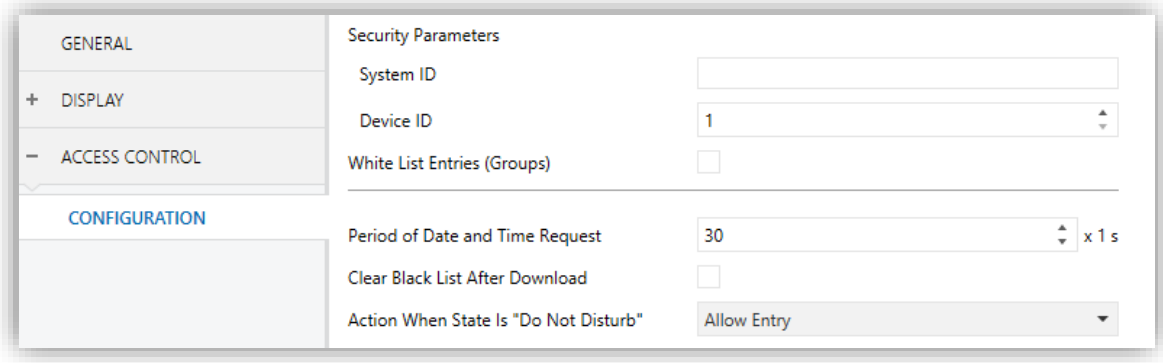

Figure 19. Access Control.

This screen contains the following parameters:

- **Security Parameters**
  - **System ID**: this value shall be common for all IWAC Display v2 in the installation. It is an essential part of the communication security.
  - **Device ID**: this value shall be unique for each IWAC Display v2 in the installation. If not, the proper communication with the system is not guaranteed. Like the previous one, this value is an essential part of the communication security.
- **White List Entries (Groups)**: it is possible to configure up to five groups in the white list of IWAC Display v2. These groups will be included (or updated) in the white list every start-up process. Groups are: "Guest", "Visitor", "Staff", "Management", "Service", "Cleaning", "Maintenance", "Security".

- **Period of Date and Time Request**: sending period (1 to 255 seconds) of the "**Request Date and Time**" object in order to receive an update of date and time by Z-Access. This periodic sending will stop when receiving a correct date and time.

- **Clear Black List After Download**: when enabled, the black list will be deleted after a full download (or a partial download which involve parameter changes). When disabled (by default) the black list will remain after download.

- **Action When State Is "Do Not Disturb"**: sets the action to perform when a group with access permission tries to access to a room in "Do Not Disturb" status.

  This action only applies to the groups; the guests of the room (cards with individual access to the room) will always have access regardless of the room status.

  It is possible to choose from among the following actions:

  - Allow Entry: regardless of the status of the room, any card with valid access permissions is allowed to get in.

  - Allow Entry on Second Attempt: in the first access attempt, the message configured in the Texts tab (see section 2.4.2) is displayed. If there is a second access attempt with the same card within the next 30 seconds, access is granted.

  - Deny Entry: the access to the room is denied directly.

ANNEX I. COMMUNICATION OBJECTS

- **"Functional range**" shows the values that, with independence of any other values permitted by the bus according to the object size, may be of any use or have a particular meaning because of the specifications or restrictions from both the KNX standard or the application programme itself.

Number	Size	I/O	Flags	Data type (DPT)	Functional Range	Name	Function
1	1 Bit	I	C - - W -	DPT_Enable	0/1	Sound	0 = Disable; 1 = Enable
	1 Bit	I	C - - W -	DPT_Enable	0/1	Sound	0 = Enable; 1 = Disable
2	1 Byte	I	C - - W -	DPT_Room_State	0-2	Room State: Control	0 = Normal; 1 = Make Up; 2 = Do Not Disturb
3	1 Bit	O	C T R - -	DPT_Switch	0/1	Room State: Make Up Room (Status)	0 = No Active; 1 = Active
4	1 Bit	O	C T R - -	DPT_Switch	0/1	Room State: Do Not Disturb (Status)	0 = No Active; 1 = Active
5	1 Bit		C T - - -	DPT_Trigger	0/1	Request Date and Time	Make Request
6	14 Bytes	O	C T R - -	DPT_String_8859_1		Access Log	Access Log Data
7	1 Bit	I	C - - W -	DPT_Enable	0/1	[Buttons] Lock	0 = Unlock; 1 = Lock
	1 Bit	I	C - - W -	DPT_Enable	0/1	[Buttons] Lock	0 = Lock; 1 = Unlock
8	1 Byte	O	C T R - -	DPT_SceneControl	0-63; 128-191	[Buttons] Scenes	Scene Value
9, 11, 13	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Binary Control: "0"	1-Bit Generic Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Binary Control: "1"	1-Bit Generic Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Binary Control: "0/1"	1-Bit Generic Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Binary Control, Hold&Release	1-Bit Generic Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Two Objects, Short Press: "0"	1-Bit Generic Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Two Objects, Short Press: "1"	1-Bit Generic Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Two Objects, Short Press: "0/1"	1-Bit Generic Control
	1 Byte	O	C T R - -	DPT_Value_1_Ucount	0 - 255	[Button] [x] Two Objects, Short Press: 1-byte Value (Unsigned Int)	0 - 255
10, 12, 14	1 Byte	O	C T R - -	DPT_Value_1_Ucount	0 - 255	[Button] [x] Two Objects, Long Press: 1-byte Value (Unsigned Int)	0 - 255
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Two Objects, Long Press: "0"	1-Bit Generic Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Two Objects, Long Press: "1"	1-Bit Generic Control
	1 Bit	O	C T R - -	DPT_Switch	0/1	[Button] [x] Two Objects, Long Press: "0/1"	1-Bit Generic Control
15	1 Bit		C T - - -	DPT_Trigger	0/1	[Heartbeat] Object to Send '1'	Sending of '1' Periodically
16, 22	1 Bit	I	C - - W -	DPT_Enable	0/1	[Ix] Input Lock	0 = Unlock; 1 = Lock
17, 23	1 Bit		C T - - -	DPT_Switch	0/1	[Ix] [Short Press] 0	Sending of 0
	1 Bit		C T - - -	DPT_Switch	0/1	[Ix] [Short Press] 1	Sending of 1
	1 Bit	I	C T - W -	DPT_Switch	0/1	[Ix] [Short Press] 0/1 Switching	Switching 0/1

	1 Bit		C T - - -	DPT_UpDown	0/1	[Ix] [Short Press] Move Up Shutter	Sending of 0 (Up)
	1 Bit		C T - - -	DPT_UpDown	0/1	[Ix] [Short Press] Move Down Shutter	Sending of 1 (Down)
	1 Bit		C T - - -	DPT_UpDown	0/1	[Ix] [Short Press] Move Up/Down Shutter	Switching 0/1 (Up/Down)
	1 Bit		C T - - -	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Up Shutter	Sending of 0 (Stop/Step Up)
	1 Bit		C T - - -	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Down Shutter	Sending of 1 (Stop/Step Down)
	1 Bit		C T - - -	DPT_Step	0/1	[Ix] [Short Press] Stop/Step Shutter (Switched)	Switching of 0/1 (Stop/Step Up/Down)
	4 Bit		C T - - -	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Short Press] Brighter	Increase Brightness
	4 Bit		C T - - -	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Short Press] Darker	Decrease Brightness
	4 Bit		C T - - -	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Short Press] Brighter/Darker	Switch Bright/Dark
	1 Bit		C T - - -	DPT_Switch	0/1	[Ix] [Short Press] Light On	Sending of 1 (On)
	1 Bit		C T - - -	DPT_Switch	0/1	[Ix] [Short Press] Light Off	Sending of 0 (Off)
	1 Bit	I	C T - W -	DPT_Switch	0/1	[Ix] [Short Press] Light On/Off	Switching 0/1
	1 Byte		C T - - -	DPT_SceneControl	0-63; 128-191	[Ix] [Short Press] Run Scene	Sending of 0 - 63
	1 Byte		C T - - -	DPT_SceneControl	0-63; 128-191	[Ix] [Short Press] Save Scene	Sending of 128 - 191
	1 Bit	I/O	C T R W -	DPT_Switch	0/1	[Ix] [Switch/Sensor] Edge	Sending of 0 or 1
	1 Byte		C T - - -	DPT_Value_1_Ucount	0 - 255	[Ix] [Short Press] Constant Value (Integer)	0 - 255
	1 Byte		C T - - -	DPT_Scaling	0% - 100%	[Ix] [Short Press] Constant Value (Percentage)	0% - 100%
	2 Bytes		C T - - -	DPT_Value_2_Ucount	0 - 65535	[Ix] [Short Press] Constant Value (Integer)	0 - 65535
	2 Bytes		C T - - -	9.xxx	-671088.64 - 670760.96	[Ix] [Short Press] Constant Value (Float)	Float Value
18, 24	1 Byte	I	C - - W -	DPT_Scaling	0% - 100%	[Ix] [Short Press] Shutter Status (Input)	0% = Top; 100% = Bottom
	1 Byte	I	C - - W -	DPT_Scaling	0% - 100%	[Ix] [Short Press] Dimming Status (Input)	0% - 100%
19, 25	1 Bit		C T - - -	DPT_Switch	0/1	[Ix] [Long Press] 0	Sending of 0
	1 Bit		C T - - -	DPT_Switch	0/1	[Ix] [Long Press] 1	Sending of 1

	1 Bit	I	C T - W -	DPT_Switch	0/1	[Ix] [Long Press] 0/1 Switching	Switching 0/1
	1 Bit		C T - - -	DPT_UpDown	0/1	[Ix] [Long Press] Move Up Shutter	Sending of 0 (Up)
	1 Bit		C T - - -	DPT_UpDown	0/1	[Ix] [Long Press] Move Down Shutter	Sending of 1 (Down)
	1 Bit		C T - - -	DPT_UpDown	0/1	[Ix] [Long Press] Move Up/Down Shutter	Switching 0/1 (Up/Down)
	1 Bit		C T - - -	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Up Shutter	Sending of 0 (Stop/Step Up)
	1 Bit		C T - - -	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Down Shutter	Sending of 1 (Stop/Step Down)
	1 Bit		C T - - -	DPT_Step	0/1	[Ix] [Long Press] Stop/Step Shutter (Switched)	Switching of 0/1 (Stop/Step Up/Down)
	4 Bit		C T - - -	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Long Press] Brighter	Long Pr. -> Brighter; Release -> Stop
	4 Bit		C T - - -	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Long Press] Darker	Long Pr. -> Darker; Release -> Stop
	4 Bit		C T - - -	DPT_Control_Dimming	0x0 (Stop) 0x1 (Dec. by 100%) ... 0x7 (Dec. by 1%) 0x8 (Stop) 0x9 (Inc. by 100%) ... 0xF (Inc. by 1%)	[Ix] [Long Press] Brighter/Darker	Long Pr. -> Brighter/Darker; Release -> Stop
	1 Bit		C T - - -	DPT_Switch	0/1	[Ix] [Long Press] Light On	Sending of 1 (On)
	1 Bit		C T - - -	DPT_Switch	0/1	[Ix] [Long Press] Light Off	Sending of 0 (Off)
	1 Bit	I	C T - W -	DPT_Switch	0/1	[Ix] [Long Press] Light On/Off	Switching 0/1
	1 Byte		C T - - -	DPT_SceneControl	0-63; 128-191	[Ix] [Long Press] Run Scene	Sending of 0 - 63
	1 Byte		C T - - -	DPT_SceneControl	0-63; 128-191	[Ix] [Long Press] Save Scene	Sending of 128 - 191
	1 Bit	O	C T R - -	DPT_Alarm	0/1	[Ix] [Switch/Sensor] Alarm: Breakdown or Sabotage	1 = Alarm; 0 = No Alarm
	2 Bytes		C T - - -	9.xxx	-671088.64 - 670760.96	[Ix] [Long Press] Constant Value (Float)	Float Value
	2 Bytes		C T - - -	DPT_Value_2_Ucount	0 - 65535	[Ix] [Long Press] Constant Value (Integer)	0 - 65535
	1 Byte		C T - - -	DPT_Scaling	0% - 100%	[Ix] [Long Press] Constant Value (Percentage)	0% - 100%
	1 Byte		C T - - -	DPT_Value_1_Ucount	0 - 255	[Ix] [Long Press] Constant Value (Integer)	0 - 255
20, 26	1 Bit		C T - - -	DPT_Trigger	0/1	[Ix] [Long Press/Release] Stop Shutter	Release -> Stop Shutter
21, 27	1 Byte	I	C - - W -	DPT_Scaling	0% - 100%	[Ix] [Long Press] Dimming Status (Input)	0% - 100%
	1 Byte	I	C - - W -	DPT_Scaling	0% - 100%	[Ix] [Long Press] Shutter Status (Input)	0% = Top; 100% = Bottom

28	1 Byte	I	C - - W -	DPT_SceneNumber	0-63; 128-191	[Motion Detector] Scene Input	Scene Value
29	1 Byte		C T - - -	DPT_SceneControl	0-63; 128-191	[Motion Detector] Scene Output	Scene Value
30, 59	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[Ix] Luminosity	0-100%
31, 60	1 Bit	O	C T R - -	DPT_Alarm	0/1	[Ix] Open Circuit Error	0 = No Error; 1 = Open Circuit Error
32, 61	1 Bit	O	C T R - -	DPT_Alarm	0/1	[Ix] Short Circuit Error	0 = No Error; 1 = Short Circuit Error
33, 62	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[Ix] Presence State (Scaling)	0-100%
34, 63	1 Byte	O	C T R - -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Ix] Presence State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
35, 64	1 Bit	O	C T R - -	DPT_Occupancy	0/1	[Ix] Presence State (Binary)	Binary Value
	1 Bit	O	C T R - -	DPT_Ack	0/1	[Ix] Presence: Slave Output	1 = Motion Detected
36, 65	1 Bit	I	C - - W -	DPT_Window_Door	0/1	[Ix] Presence Trigger	Binary Value to Trigger the Presence Detection
37, 66	1 Bit	I	C - - W -	DPT_Ack	0/1	[Ix] Presence: Slave Input	0 = Nothing; 1 = Detection from slave device
38, 67	2 Bytes	I	C - - W -	DPT_TimePeriodSec	0-65535	[Ix] Presence: Waiting Time	0-65535 s.
39, 68	2 Bytes	I	C - - W -	DPT_TimePeriodSec	1-65535	[Ix] Presence: Listening Time	1-65535 s.
40, 69	1 Bit	I	C - - W -	DPT_Enable	0/1	[Ix] Presence: Enable	According to parameters
41, 70	1 Bit	I	C - - W -	DPT_DayNight	0/1	[Ix] Presence: Day/Night	According to parameters
42, 71	1 Bit	O	C T R - -	DPT_Occupancy	0/1	[Ix] Presence: Occupancy State	0 = Not Occupied; 1 = Occupied
43, 72	1 Bit	I	C - - W -	DPT_Ack	0/1	[Ix] External Motion Detection	0 = Nothing; 1 = Motion detected by an external sensor
44, 49, 54, 73, 78, 83	1 Byte	O	C T R - -	DPT_Scaling	0% - 100%	[Ix] [Cx] Detection State (Scaling)	0-100%
45, 50, 55, 74, 79, 84	1 Byte	O	C T R - -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[Ix] [Cx] Detection State (HVAC)	Auto, Comfort, Standby, Economy, Building Protection
46, 51, 56, 75, 80, 85	1 Bit	O	C T R - -	DPT_Switch	0/1	[Ix] [Cx] Detection State (Binary)	Binary Value
47, 52, 57, 76, 81, 86	1 Bit	I	C - - W -	DPT_Enable	0/1	[Ix] [Cx] Enable Channel	According to parameters
48, 53, 58, 77, 82, 87	1 Bit	I	C - - W -	DPT_Switch	0/1	[Ix] [Cx] Force State	0 = No Detection; 1 = Detection
88, 92	2 Bytes	O	C T R - -	DPT_Value_Temp	-273.00 - 670760.00	[Ix] Current Temperature	Temperature Sensor Value
89, 93	1 Bit	O	C T R - -	DPT_Alarm	0/1	[Ix] Overcooling	0 = No Alarm; 1 = Alarm
90, 94	1 Bit	O	C T R - -	DPT_Alarm	0/1	[Ix] Overheating	0 = No Alarm; 1 = Alarm
91, 95	1 Bit	O	C T R - -	DPT_Alarm	0/1	[Ix] Probe Error	0 = No Alarm; 1 = Alarm

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